

What is Claimed is:

1. A device for delivering at least one active agent to a localized body surface comprising:

a substantially water-soluble or substantially water-dispersible carrier comprising at least one polymer and at least one plasticizer, and having a first surface and a second surface;

a substantially water-soluble or substantially water-dispersible adhesive disposed on at least a portion of the first surface of the carrier, and having a carrier surface in contact with first surface of the carrier and an application surface, generally opposed to the carrier surface; and

at least one support layer releasably adhered to the application surface of the adhesive, the second surface of the carrier, or both.

2. The device of claim 1 wherein the carrier comprises a polymeric film, a woven fabric, a knitted fabric, a nonwoven fabric, an open cell foam or a closed cell foam.

3. The device of claim 1 wherein the at least one polymer is made from one or more substantially water-soluble or substantially water-dispersible monomers.

4. The device of claim 1 wherein the at least one polymer comprises a polyvinyl alcohol, a polyvinyl pyrrolidone, a protein, a carbohydrate, an alginic acid, a polyethyleneimine, a polyoxyalkylene, a polyacrylate, a polymethacrylate, a polyacrylamide, a polymethacrylamide, a homopolymer of ethenically unsaturated monomers, or a copolymer comprising ethenically unsaturated monomers.

5. The device of claim 4 wherein the protein is collagen, gelatin, any derivative thereof, or any combination of any of the foregoing.

6. The device of claim 4 wherein the carbohydrate comprises arabinogalactan.

7. The device of claim 1 wherein the at least one plasticizer comprises a monohydric alcohol, a polyhydric alcohol, polyethylene-glycol, a polyether, a surfactant, an amide, a

lactam, an amine, an amine salt,  $\alpha$ -tocopherol, or any mixture including any of any of the foregoing.

8. The device of claim 7 wherein the monohydric alcohol is 3-methoxy-3-methyl-1-butanol, alkyl ether ethoxylate, alkyl ester ethoxylate, aryl ether ethoxylate, aryl ester ethoxylate, aralkyl ether ethoxylate, or aralkyl ester ethoxylate.

9. The device of claim 7 wherein the polyhydric alcohol is glycerin, polyglycerol, alkyl polyglycoside, diethylene glycol, triethylene glycol, polyethylene glycol, a random copolymer of ethylene oxide and propylene oxide, a block copolymer of ethylene oxide and propylene oxide, propylene glycol, sorbitol, a sorbitol ester, butanediol, or an alkoxyated derivative of any of the foregoing.

10. The device of claim 1 wherein the adhesive comprises a pressure sensitive adhesive.

11. The device of claim 10 wherein the pressure sensitive adhesive comprises a mixture of:

- i) at least one substantially water-soluble or substantially water-dispersible polymer, and
- ii) at least one plasticizer in an amount sufficient to provide a desired degree of pressure sensitive tack.

12. The device of claim 11 wherein the at least one substantially water-soluble or substantially water-dispersible polymer is made from at least one substantially water-soluble or substantially water-dispersible monomer.

13. The device of claim 11 wherein the at least one substantially water-soluble or substantially water-dispersible polymer is poly(ethylene oxide), a polysaccharide, a polysaccharide derivative, a homopolymer of ethenically unsaturated monomers, or a copolymer comprising ethenically unsaturated monomers.

14. The device of claim 1 wherein the at least one support layer is paper, a polymeric film, a foil, or any combination of the foregoing.

15. A system for delivering at least one active agent to a localized body surface comprising:

a substantially water-soluble or substantially water-dispersible carrier comprising at least one polymer and at least one plasticizer, and having a first surface and a second surface;

a substantially water-soluble or substantially water-dispersible adhesive disposed on at least a portion of the first surface of the carrier, and having a carrier surface in contact with first surface of the carrier, and an application surface generally opposed to the carrier surface;

at least one active agent in association with the carrier, the adhesive, or both; and  
at least one support layer releasably adhered to the application surface of the adhesive, the second surface of the carrier, or both.

16. The system of claim 15 wherein the at least one active agent is effective for treatment of skin, hair, fingernails, toenails, teeth, or mucosal tissue.

17. The system of claim 16 wherein the at least one active agent is a dye, a pigment, a bleaching agent, or a hair colorant.

18. The system of claim 16 wherein the at least one active agent is a breath freshener, hydrogen peroxide, carbamide peroxide, sodium fluoride, sodium monophosphate, pyrophosphate, chlorhexidine gluconate, polyphosphate, triclosan, a flavorant, a fluoridating agent, a teeth whitening agent, a dental stain remover, a plaque remover, or a tartar remover.

19. The system of claim 16 wherein the at least one active agent is a glitter, an ornamental design, a mask, an applique or a tattoo.

20. The system of claim 16 wherein the at least one active agent is a fragrance, a perfume, an emollient, a humectant, a conditioner, a moisturizer, a surfactant, an herbal extract, a skin colorant, a color cosmetic, an emulsifier, a skin soothing agent, a skin tightening agent, an artificial tanning agent, a tanning accelerant, an anti-wrinkle agent, an exfolient, a sebum inhibiting agent, a sebum stimulator, a protease inhibitor, an anti-itch ingredient, an agent for inhibiting hair growth, an agent for accelerating hair growth, a hair remover, a skin sensate, a depilating agent or an astringent.

21. The system of claim 16 wherein the at least one active agent is a sunscreen agent, an insect repellant, an antiperspirant or a deodorant.

22. The system of claim 16 wherein the at least one active agent is a drug, a vitamin, a hormone, an antioxidant, an anti-inflammatory agent, a steroid, an antipruritic agent, an antifungal agent, an antibiotic, an antimicrobial agent, an antidandruff agent, an antiacne agent, a skin repair agent, a callus remover, a wart remover or a corn remover.

23. The system of claim 15 wherein the at least one active agent is associated with the carrier.

24. The system of claim 23 wherein the at least one active agent forms a coating on at least one surface of the carrier.

25. The system of claim 23 wherein the at least one active agent is dissolved, suspended, or emulsified within the carrier.

26. The system of claim 15 wherein the at least one active agent is associated with the adhesive.

27. The system of claim 26 wherein the at least one active agent forms a coating on the application surface of the adhesive.

28. The system of claim 26 wherein the at least one active agent is dissolved, suspended, or emulsified within the adhesive.

29. The system of claim 15 wherein the carrier comprises a polymeric film, a woven fabric, a nonwoven fabric, an open cell foam or a closed cell foam.

30. The system of claim 15 wherein the at least one polymer is made from one or more substantially water-soluble or substantially water-dispersible monomers.

31. The system of claim 15 wherein the at least one polymer comprises a polyvinyl alcohol, a polyvinyl pyrrolidone, a protein, a carbohydrate, an alginic acid, a polyethyleneimine, a polyoxyalkylene, a polyacrylate, a polymethacrylate, a polyacrylamide, a polymethacrylamide, a homopolymer of ethenically unsaturated monomers, or a copolymer comprising ethenically unsaturated monomers.

32. The system of claim 15 wherein the at least one plasticizer comprises a monohydric alcohol, a polyhydric alcohol, polyethylene glycol, a polyether, a surfactant, an amide, a lactam, an amine, an amine salt,  $\alpha$ -tocopherol, or any mixture including any of any of the foregoing.

33. The system of claim 32 wherein the monohydric alcohol is 3-methoxy-3-methyl-1-butanol, an alkyl ether ethoxylate, an alkyl ester ethoxylate, an aryl ether ethoxylate, an aryl ester ethoxylate, an aralkyl ether ethoxylate, or an aralkyl ester ethoxylate.

34. The system of claim 32 wherein the polyhydric alcohol is glycerin, a polyglycerol, an alkyl polyglycoside, diethylene glycol, triethylene glycol, a polyethylene glycol, a random copolymer of ethylene oxide and propylene oxide, a block copolymer of ethylene oxide and propylene oxide, propylene glycol, sorbitol, a sorbitol ester, butanediol, or an alkoxyated derivative of any of the foregoing.

35. The system of claim 15 wherein the adhesive comprises a pressure sensitive adhesive.

36. The system of claim 35 wherein the pressure sensitive adhesive comprises a mixture of:

5 i) at least one substantially water-soluble or substantially water-dispersible polymer, and

ii) at least one plasticizer in an amount sufficient to provide a desired degree of pressure sensitive tack.

10 37. The system of claim 36 wherein the at least one substantially water-soluble or substantially water-dispersible polymer is made from at least one substantially water-soluble or substantially water-dispersible monomer.

15 38. The device of claim 36 wherein the at least one substantially water-soluble or substantially water-dispersible polymer comprises poly(ethylene oxide), a polysaccharide, a polysaccharide derivative, a homopolymer of ethenically unsaturated monomers, or a copolymer comprising ethenically unsaturated monomers.

20 39. The system of claim 15 wherein the at least one support layer is paper, a polymeric film, a foil, or any combination of any of the foregoing.

40. A method of making a device for delivery of at least one active agent to a localized body surface, the method comprising:

providing a water-soluble or water-dispersible carrier having a first surface and a second surface;

25 dissolving at least one water-soluble or water-dispersible polymer in a solvent to form a solution;

selecting a plasticizer such that when the plasticizer is added to the solution and the solution is dried to form a pressure sensitive adhesive, the plasticizer will provide a desired degree of pressure sensitive tack;

30 adding the plasticizer to the solution in an amount sufficient to provide a desired degree of pressure sensitive tack to the pressure sensitive adhesive.

drying the solution to form the pressure sensitive adhesive;

adding at least one active agent to the carrier, the pressure sensitive adhesive, or both;

applying the pressure sensitive adhesive to at least a portion of the first surface of the carrier, thereby defining a carrier surface of the pressure sensitive adhesive in contact with the first surface of the carrier and an application surface of the pressure sensitive adhesive generally opposed to the carrier surface; and

removably adhering at least one support layer to the second surface of the carrier, the application surface of the pressure sensitive adhesive, or both.

41. The method of claim 40 wherein the carrier further comprises at least one active agent.

42. The method of claim 40 wherein adding the at least one active agent to the pressure sensitive adhesive comprises adding at least one active agent to the solution before drying.

43. The method of claim 40 wherein the at least one active agent is a coating on at least one surface of the carrier, the pressure sensitive adhesive, or both.

44. The method of claim 40 wherein the at least one active agent is effective for treatment of skin, hair, fingernails, toenails, teeth, or mucosal tissue.

45. A method of delivering at least one active agent to a localized body surface, the method comprising:

providing a delivery device comprising

i) a substantially water-soluble or substantially water-dispersible carrier comprising at least one polymer and at least one plasticizer, and having a first surface and a second surface,

ii) a substantially water-soluble or substantially water-dispersible adhesive disposed on at least a portion of the first surface of the carrier, and having a carrier surface in contact with first surface of the carrier, and an application surface generally opposed to the carrier surface,

iii) at least one active agent in association with the carrier, the adhesive, or both, and

iv) at least one support layer releasably adhered to the application surface of the adhesive, the second surface of the carrier, or both;

5 adhering the device to the subject;

allowing the active agent to be delivered to the localized body surface; and removing the device.

10 46. The method of claim 45 further comprising rubbing the active agent into the localized body surface.

47. The method of claim 45 wherein adhering the device to the localized body surface comprises adhering the device to dry skin, dry hair, a dry fingernail or a dry toenail.

15 48. The method of claim 47 wherein allowing the active agent to be delivered to the localized body surface comprises leaving the device in contact with the localized body surface for at least about one hour before removing the device.

20 49. The method of claim 45 wherein the at least one active agent provides a systemic treatment.

50. The method of claim 45 wherein removing the device comprises dissolving or dispersing the device in an aqueous medium.